

REMARKS

Applicant thanks the Examiner for the careful review of this application. Claim 9 has been cancelled without prejudice. Therefore, claims 1-8 remain pending in this application. The Office Action rejects claims 1-8 as obvious under 35 U.S.C. § 103 over Crewe (U.S. Patent 4,760,567) in view of Nickel (U.S. Application 2003/0007443). Applicant submits that the rejection must be withdrawn, as the combination of Crewe and Nickel would be inoperative and thus cannot anticipate or render obvious the claimed invention as cited in the Office Action.

Claims 1-8

Crewe provides a classic memory system based on a rotating disc. In particular, Crewe, in its own words, provides “A rapid random accessed electron beam memory system [comprising] a disc mounted for rotation and supporting an information storage medium. An electron gun is mounted for movement across the disc.” (See Crewe, Abstract, lines 1-4.) Thus, Crewe describes a disc drive using an electron gun.

Nickel provides a data storage system including nanotube sources. Notably, Nickel never describes the data storage medium as moving or mobile. The nanotubes are described as either being fixed relative to the data storage medium, or mounted on micromovers. (See Nickel, paragraph 013.) For the nanotubes to be fixed relative to the medium, the medium must also be fixed. Theoretically, one might develop a system where the nanotubes and medium always move together (and thus are fixed in the same frame of reference) – but that is not described in Nickel, and would be extremely complicated to achieve.

The alternative mentioned is that the nanotubes are mounted on micromovers, which are known to be actuators allowing for a small amount of movement over a well-defined area. Thus, the nanotubes would be mounted for motion over a small area, potentially corresponding to a small section of the medium in question. This still does not make any reference to the storage medium moving or rotating.

Against this background (nanotubes that are stationary or may move slightly relative to the storage medium), Nickel introduces three other points. One, an array of hundreds or thousands of nanotubes may be used and scanned across the (stationary) medium. Two, the nanotubes are proximate to the surface of the storage medium – that is the nanotubes are very

close to the surface of the storage medium. Three, the nanotubes are rugged enough to survive undamaged a collision with the surface of the storage medium. All of these qualities make sense in a device where the nanotubes are positioned with micromovers or simply do not move relative to the storage medium – any collision would be a relatively low-energy event and the normal situation would be a close (proximate) relationship without contact.

However, the Office Action combines Nickel with a classic approach to a disc drive – namely a rotating storage medium and a moving head. Here, the combination breaks down. The rotating storage medium of Crewe would likely rotate at 3600 RPM, 5400 RPM or greater (some modern discs rotate at 7200 RPM, for example). Additionally, the head is mounted so that it can be scanned across the medium in Crewe, introducing additional motion into the system, and thus energy into any potential collision. A nanotube would not be able to stand up to such a collision in the way contemplated by Nickel. On the contrary, the collision would have a similar result as is seen in a head crash in a magnetic disc drive. Nickel refers to nanotubes as proximate to the storage medium, but such a relationship is not possible with the system described in Crewe. Thus, one cannot combine Nickel with Crewe to provide an operable combination. Rather, one would, at best, get a disc drive from Crewe, and a separate storage device from Nickel which does not work compatibly with Crewe on a mechanical level. Additionally, it is notable that no commercial products are known to incorporate the scheme used by Nickel – suggesting that the Nickel approach may be either infeasible or simply inoperative in and of itself.

As the combination of Nickel and Crewe is inoperative, Applicant submits that the rejection over Crewe in view of Nickel must be withdrawn. Based on the rejection presented in the Office Action, Crewe, Nickel, and the combination thereof cannot render the present claims obvious. Likewise, the references cannot anticipate the claims based on the rejection presented in the Office Action. Accordingly, Applicant requests withdrawal of the rejection of claims 1-8.

Claim 9

Claim 9 has been rejected under 35 U.S.C. § 112. Applicant has cancelled claim 9 without prejudice. Accordingly, Applicant submits that the rejection of claim 9 is rendered moot. Applicant does not agree with the propriety of the rejection in question. However, Applicant is


cancelling claim 9 in the interest of providing for efficient prosecution of the remaining claims in the application.

CONCLUSION

Applicant submits that all pending claims are patentable, and respectfully requests an early Notice of Allowance. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,

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Glenn E. Von Tersch
Registration No. 41,364

Correspondence Address:

Customer No. 45965
Technical & Intellectual Property Strategy Group
Telephone: 650-293-3352